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Forest Pest Management

BIOLOGICAL
EVALUATION R2-76-1

DWARF MISTLETOE
ARAPAHO &
ROOSEVELT NATIONAL FORESTS
REDFEATHER RANGER DISTRICT

SEPTEMBER 1974

Rocky Mountain Region

U.S. Department of Agriculture Forest Service

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SEPTEMBER 1974

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A timber producing area located on and adjacent to Bull Mountain in the north central part of the Redfeather Ranger District was selected in 1974 for an extensive type survey to determine the distribution and intensity of lodgepole pine dwarf mistletoe. The survey data can be used to identify and classify management units in need of dwarf mistletoe control that can be accomplished through timber sales and timber stand improvement work. A similar survey was conducted in another management unit in the district in 1973 (1).

TECHNICAL INFORMATION

Causal Agent: Arceuthobium americanum Nutt. dwarf mistletoe.

Host: Pinus Contorta var. latifolia Dougl., lodgepole pine.

Type of Damage: Overstory trees occurring as scattered individuals or groups show varying amounts of dwarf mistletoe infections that can spread the disease to understory trees. Continued tree exposure and intensification of the disease can cause loss in height and diameter growth leading eventually to growth stagnation and tree mortality.

Extent of Outbreak: Dwarf mistletoe was detected throughout all age classes sampled with the mature and overmature stands showing heavy infection levels. The pole and small sawtimber showed moderate levels of infection while seedlings and samplings showed the lowest levels.

Location of Outbreak: The area included in the survey involved 7 compartments beginning along the east slopes of Bull Mountain and bounded by Sheep Creek on the north and east; Black Mountain and Little Bald Mountain on the south; and Deadman Road on the west (see attached map).

DISCUSSION

The survey consisted of sample points spaced out at 10 chain intervals along parallel transects giving a sampling intensity of one plot for every 10 acres. A stratified sample, consisting of a prism plot for the overstory and a 1/100 acre circular plot for the understory was taken at each sample point. Other data collected in addition to tree density and incidence of dwarf mistletoe included site index, age, height, and diameter of trees.

Of 32,717 acres surveyed, 28,425 were forested of which approximately 20,000 acres was lodgepole pine type. The stands varied from one-, two-, and three-storied to multi-storied in structure. At the lower and upper elevations, lodgepole pine is mixed in with aspen and spruce-fir, respectively. The total area included in the survey has a varied history of timber harvest

from clearcut to partial cutting, including repeated entries in some stands. Tree density varied from dense or "dog hair" to scattered, overmature overstory. Regeneration was present in varying degrees in cutover and partial-cut stands. Site index measurements taken periodically, indicate a range of values from 41 to 72. Overstory volumes per acre ranged from less than 3 MBF to more than 6 MBF. A summary of the survey data for each compartment is described in Table I.

TABLE I
SURVEY SUMMARY

Compartment	Total Forested Acres (No.)	Lodgepole Pine Acreage					
		With Overstory Dwarf Mistletoe			With Understory Dwarf Mistletoe		
		Total (No.)	Infected (No.)	(%)	Total (No.)	Infected (No.)	(%)
Deadman	9,863	4,981	4,527	90.9	3,306	1,111	33.6
Sand Creek	3,347	1,409	717	50.9	1,463	568	38.8
Eaton	3,301	1,173	1,153	98.3	899	396	44.0
Osborn	3,105	3,093	2,946	95.2	1,982	1,208	60.9
George	3,498	1,629	1,529	93.9	922	454	49.2
North Poudre	1,733	696	696	100.0	--	--	--
Upper Panhandle	3,578	--	--	--	--	--	--
TOTALS:	28,425	12,981	11,568	89.1	8,572	3,737	43.6

An average of 89.1 percent of the overstory acreage in 6 compartments, and an average of 43.6 percent of the understory acreage in 5 compartments, were infected with dwarf mistletoe. These infection levels were 1.6 and 5.6 times as great as those found for infected overstory and understory acreages, respectively, in the 1973 survey (1). With the exception of one compartment, the overstory acreage infected with dwarf mistletoe was over 90 percent, with one compartment having 100 percent. Considerable variation existed for infected acreages in the understory which did not appear to be correlated in any way with the infection incidence for the overstory acreage. The greater over-all incidence of dwarf mistletoe in this management unit would necessarily make it of higher priority and of greater urgency for treatment from the pathological standpoint than those units surveyed in 1973. The intensity of dwarf mistletoe is one of many factors which must be weighed in assigning treatment priorities for individual stands.

Most of the field data was transferred onto maps and overlays. These can be used by District personnel in developing management plans, including any needed timber sales, for each unit.

RECOMMENDATIONS

The following are suggestions and recommendations on how to utilize the data collected in the survey:

1) Develop comprehensive management plans, for all the compartments surveyed, including provisions for dwarf mistletoe suppression.

2) Utilize survey information promptly before personnel or program changes interfere with processing and incorporating the data into action programs.

3) Incorporate a systematic approach to dwarf mistletoe suppression. The highest priority work is overstory removal which should be completed in the following order:

   a) Remove infected overstory in stands having reproduction between 10- and 20-years of age.

   b) Remove infected overstory in stands having reproduction under 10 years of age.

   c) Schedule sales in residual stands with a history of partial cutting that contain pockets of advanced reproduction, over 20 years of age, infected with dwarf mistletoe.

   It is important to remove infected overstory in all units as promptly as possible in order to assure productive stands.

   The next highest priority is in infected stands of precommercial thinning age. Each stand should be surveyed individually, using

the dwarf mistletoe survey procedure recommended for gathering inputs for the LPMIST simulation yield program (2, 3). When the best management alternatives are selected from the LPMIST projections, then these stands can be ranked by priority and scheduled for thinning as funds become available. The dwarf mistletoe survey should be conducted within 5 years of the scheduled time of thinning.

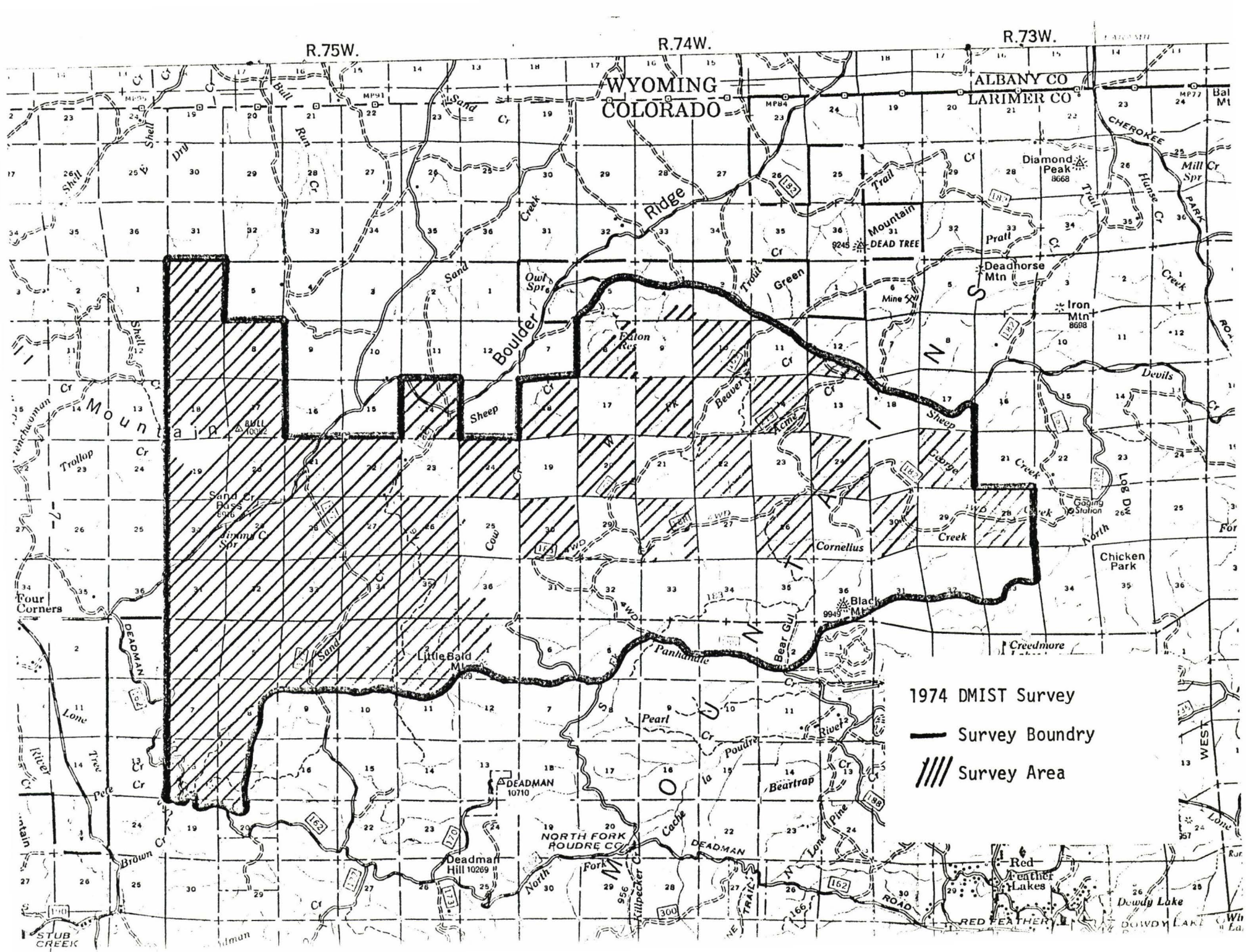
4) Maintain all survey and report data in a clearly-identifiable working file.

REFERENCES

(1) Biological Evaluation, Dwarf Mistletoe, Arapaho-Roosevelt National Forest, Redfeather Ranger District, USDA - Forest Service, Mimeograph Report, R2-74-6, August 1974.

(2) Donald Brown. An Evaluation Procedure for Dwarf Mistletoe in Proposed Thinning Projects, USDA - Forest Service, Region Two, Mimeograph Report, May 1975.

(3) Clifford A. Meyers, Frank G. Hawksworth, and James L. Stewart. Simulating Yields of Managed Dwarf Mistletoe-Infested Lodgepole Pine Stands, USDA - Forest Service Research Paper, RM-72, 15 p., 1971.


R.75W.
R.74W.
R.73W.
WYOMING
COLORADO
ALBANY CO
LARIMER CO
Mountain
Ridge
Boulder
Sand Cr
Bull Run Cr
Shell Cr
Dry Cr
Owl Spr
Green Mtn
Trail
Diamond Peak 8668
Deadhorse Mtn
Iron Mtn 8698
Mill Cr Spr
Hanse Cr
Cherokee Trail
Park
Devils Creek
Sheep Cr
Beaver Cr
Acme
Cabbage Creek
Log Dg
Gaging Station
North Creek
Cornelius
Chicken Park
Black Mt 9949
Creedmore
Panhandle
Bear Gul
Little Bald Mt
Four Corners
Deadman
Sand Cr Pass
Zimma C Spr
Cow Cr
Trollop Cr
Lone Tree Cr
Pete Cr
Brown Cr
Pearl Cr
Poudre River
Beartrap
Deadman Hill 10269
NORTH FORK ROUDRE CO
Cache la Poudre
Killpecker Cr
Lone Pine
Red Feather Lakes
Dowdy Lake
RED FEATHER L
DOWDY LAKE
STUB CREEK
Deadman 10710
Bull 10002
Owl Spr
Elton Res
Sand Cr Pass
Zimma C Spr
Deadman
Deadman Hill 10269
Little Bald Mt
Four Corners
Cornelius
Black Mt 9949
Creedmore
Chicken Park
Diamond Peak 8668
Deadhorse Mtn
Iron Mtn 8698
Mountain 9245 DEAD TREE
Red Feather Lakes
Dowdy Lake
1974 DMIST Survey
Survey Boundry
Survey Area